tackling
tax fraud
with a Big Data approach

Atos

The common error of under-utilizing Revenue Authority data

Revenue Authorities tend to have vast amounts of data accrued over time from both active and inactive taxpayers. Much of this information is known only in terms of the amount of data it consumes within the tax administration storage systems. Much of the intelligence value of this data remains untapped within many revenue authorities and tax administrators are frequently required to make decisions blindly – not making use of this pool of intelligence available to them.

These types of decisions do not only relate to policy, organizational decisions or Key Performance Area (KPA) monitoring, but more specifically to daily business process related decisions that could be made more efficient and accurate if the available intelligence were used correctly. This is particularly important in deciding who to audit, what compliance and enforcement steps and tools to use and where to start searching for cases of suspected evasion.

When properly managed, taxpayer registration data, return form data, audit information, objection and appeal records as well as financial transactional data, combined with selected external data, allow the revenue authority to not only determine risk profiles and measure its performance against KPAs, but also provide a vast repository of information for answering specific policy and 'what if' type questions. This paper provides a short insight into what the e-ris Risk and Tax Intelligence solutions offer the revenue administration and how these solutions enable tax data to be converted to intelligence and used for informed decision support in all domains within the revenue authority.

Unanswered questions frequently encountered in the revenue authority

Within each Revenue Authority (RA) there is a specific need for information on three main categories of data:

a) How is the RA performing in terms of its KPAs?

b) What is the risk profile of each taxpayer and how does that influence the process by which taxpayers are managed?

c) Where are the areas where evasion is most likely to occur and how can the RA drill down to better identify these areas in terms of suspect actions and suspicious taxpayers?

Measuring performance against KPAs

RAs need to monitor and report on operational and strategic performance to their respective boards, the Ministry, to senior management and further, to track this performance on a regional and tax office level. The most common approach is that of measuring and reporting on KPAs which include answers to questions such as:

▶ **Demographics:** Who are our key clients? Where are they – in which industry, in which region? What client profiles apply to which tax types?

▶ **Revenue:** Where is our greatest source of revenue by industry, by region, by tax client type, by tax type? Who are our preferred clients from a revenue perspective? Which return types generate the most revenue? Does it differ per economic activity? Does it differ per region?

▶ **Returns:** What is the return submission pattern per tax type? Does it differ per industry or per region? What is the taxpayer profile of those who file returns well in advance of the deadline and what is the profile of late filers? What does the non-filer profile look like – per tax type, per industry, per region? How do the profiles of taxpayers who are voluntarily compliant differ from those who are non-compliant? Which tax types have the highest yield per return, and which tax types have the lowest yield? Are there tax types / return types that cost more to administer than the revenue they generate?

▶ **Cash and payments:** Is there a relationship between payment amount and timeliness of payment? What payment channels are used – does this differ per tax type; region; economic activity? What does it cost us to process cash payments – is it worth maintaining this service? What do payments cost the revenue authority – via the banks, card or direct transfer? Which banks are most efficient at processing tax payments – how much more efficient are they in terms of timeliness and cost?

▶ **Debt Management:** What is the average age of our debt? Which tax types carry the largest debt? What type of debt is being written off? What are these data per economic activity; per region; per tax type?

▶ **Compliance:** What percentage of our tax base is voluntarily compliant? Where is this trend going? Are all of our legislated penalties still relevant and in use? Which tax client profiles have the greatest interest burden?

▶ **Enforcement:** Which enforcement measures are most effective? What is our cost of enforcement – what yield are we getting in terms of collections for each unit spent on collection? Does this differ per region or economic activity?

▶ **Audit:** How much does a field audit cost us? What is the ratio between the cost of audit and the marginal revenue gleaned from that audit (i.e. the audit yield)? How long does it take us to complete each type of audit? Are there regional variations in audit duration? Are there variations per industry? Are there variations within the same industry – are they by region or by tax type? Why are there variations?

▶ **Client services:** Are further large taxpayer offices required? Where should they be located? Do we need medium taxpayer offices? What is the typical profile of a 'large taxpayer?' Are our allocation rules for assigning taxpayers to the LTU correct?

- **Objections and appeals:** What is the value of disputed debt? Are there common client profiles who are constantly associated with objections? Who objects? What are the prime reasons for objection or appeal? Are objections more prevalent for certain tax types, for certain regions, for taxpayer types? How long does it take to resolve disputes?
- **Tax client channel preferences:** How do our clients interact with us – how many via portal, via email, via post, or over the counter? How are payments made – what percentage by bank transfer, cash, cheque or card? Do these payment channel patterns differ by region, by industry?
- **Tax officers:** Is the mix between number of tax officers and taxpayers they service correct? Is it correct per region? What is the mix per region if computed by revenue, rather than taxpayers? Which tax officers are more likely to initiate taxpayer audits? Who are the key officers in approving refunds? Which tax officers contribute most to system errors and the need for journal corrections? What are the tax officer profiles per business area? How many logins do they perform per week? What systems are they using? Are there links related to routine transactions between specific tax officers and tax clients?

Our Tax Analytics routines assist the RA in answering these and many more performance and decision support type questions. Our consultants will lead the RA through the process of identifying the pertinent KPA's, determining the most appropriate indicators for measuring these KPA's and then assist in determining the required data sources and building the queries to answer these questions.

Risk profiling and using risk to make process based decisions

Both the RA and taxpayers have limited resources. Routine audits based on a cyclical process where taxpayers are audited every *n* years is not only inefficient but places unnecessary strain on these limited resources: RAs assign auditors to tax audits where there is no basis for suspicion and in many cases, a very small tax liability and taxpayer clients in turn need to assign scarce financial resources to answer RA questions and support the auditors during the process. Both the RA and tax clients stand to benefit from risk based audit selection.

Secondly, low risk clients should be managed in an efficient and non-intrusive manner to encourage their continued voluntary compliance. This implies that high-risk clients should be managed in a manner that best mitigates the risk they present to the RA.

The RA data, if correctly employed, provides the basis for accurate risk assessment – which in turn allows the RA to correctly and efficiently assign scarce resources to audit, enforcement and objection cases and permits automated decision making relating to how to manage compliance, what tools to use for enforcement purposes, when to audit refunds and de-registrations and what type of audit to select to match the potential financial exposure.

Identifying suspected evasion

While tax evasion behaviors can take many forms, they usually fall into one of the following categories:

- Registration evasion relates to all situations where taxpayers fail to properly file for registration for mandatory tax types or regimes. This omission may be done willfully or through misrepresentation of their activities
- Misreporting behavior where taxpayers, willingly or not - provide incorrect return information leading to wrong (and usually lower) tax liabilities
- Refund fraud addresses specific tax regimes where a direct monetary refund is available from the tax authority to the taxpayer, under regulated conditions (this is typical in a VAT regime). Such fraud has become one of the major concerns for revenue authorities and economies over the last decade.

The RA data may be used (together with external data from third party sources) to identify areas of suspicion where there is a likelihood of one or more of these types of evasion occurring.

The Atos Risk and Tax Intelligence solution

Based on over twelve years of experience in tax and customs systems, combined with our worldwide experience of managing Big Data, we have developed specific solutions to these intelligence, risk and evasion needs experienced by the RAs. Our e-ris Risk and Tax Intelligence solution provides all of the building blocks needed to utilize existing and future data to provide answers to the above intelligence and decisions support needs.

The e-ris Risk and Tax Intelligence solution is based on a four tier structure consisting of the staging area to consolidate and prepare the data, the data warehouse – the repository for all RA and third party data, the business intelligence layer and the tax intelligence layer.
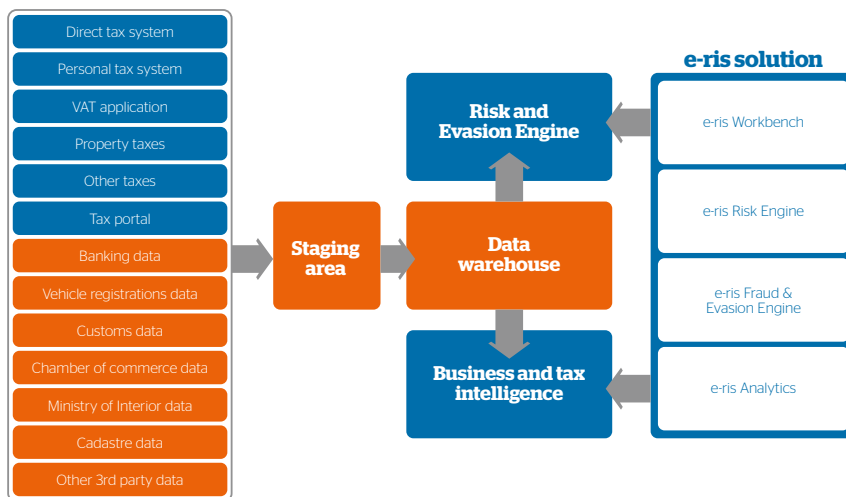
Data staging

First, we create a staging area into which we load all of the relevant legacy data, from multiple databases and structures. This allows us to utilize and consolidate data that is currently stored in differing formats and in different locations. The staging area acts as the workspace required to convert the existing data into the format required by the data warehouse. Our Extract-Transform-Load (ETL) procedures ensure that the data is correctly converted into the structures required by the data warehouse. Custom procedures then load the transformed data from the staging area into the data warehouse. It also permits us to access and load third party data from sources such as the cadaster; vehicle, aircraft and vessel registrations; customs data; banking data and national population register / commercial register – all of which significantly enhance risk analysis and evasion detection.

The data warehouse

The e-ris tax data model provides the structures needed to rapidly build a data warehouse for legacy and future data. Our solutions are based on utilizing this pre-defined tax data model to address compliance, risk, enforcement and evasion quandaries regularly faced by revenue authorities. The data warehouse data model design permits quick implementation and rapidly yields answers to tax intelligence, KPI and business process decision-making within the revenue authority.

The data warehouse is a federated repository for all of the tax data generated by the revenue authority systems as well as third party data needed for effective tax administration. It allows the storage of a large amount of information in a secure, reliable, easy to retrieve and easy to manage manner. Using the e-ris data model, the data warehouse structure permits easy exploration and data mining of all data and using tax-specific partitioning policies as well as creating data-marts based on tax business areas, allows tax officers and management ease of access to tax intelligence and business support information.

The tax data warehouse, based on e-ris data model, serves as the foundation layer for all subsequent data analysis needs.

e-ris tax analytics

The e-ris Tax Analytics solution provides answers to most of the typical KPA questions in an automated and ongoing manner – and represents the results by dashboard, graphic representations, reports, web publishing or daily / weekly / monthly email reporting to designated managers.

The Analytics feature is not only valuable for reporting but may be used with return form specific customization to assist in validating taxpayer return data against other returns for different tax types as well as from third party data sources to identify under or false reporting. In this sense, the analytics function compliments the evasion process by detecting cases of implicit fraud.
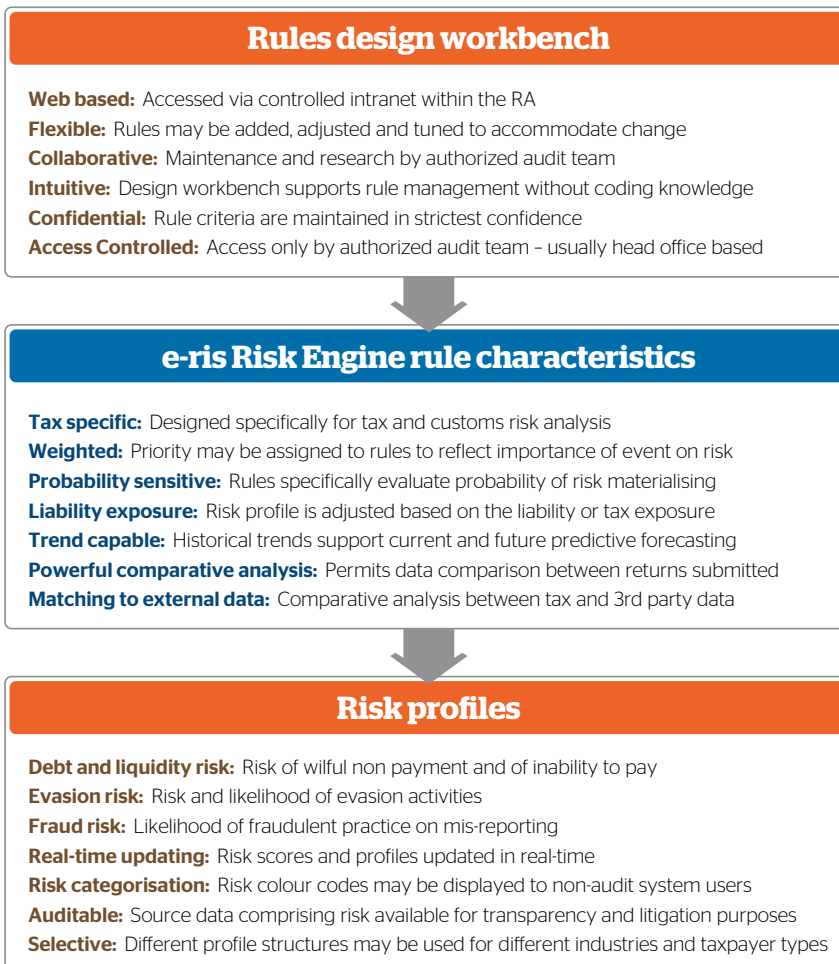
e-ris risk engine

The e-ris Risk Assessment Engine provides risk profiling based on a wide range of risk assessment rules and variables. It accesses the data warehouse data and provides the risk score back to applications that need these profiles in order to make business process decisions. Risk profiles are initially populated based on our default probability and severity variables – but these may be maintained and adjusted based on client intelligence derived from the analytics component reporting from the data warehouse.

Our default risk rules cover a wide range of risk indicators – and utilize comparative analysis, trend analysis, event occurrence (or non-occurrence) and financial exposure processes to determine the risk band associated with each taxpayer. These risk profiles permit the automation of process and workflow decisions within the tax administration software to automatically select the most appropriate tools or processes for compliance, debt management, refund and de-registration actions.

Risk profiles are used in two distinct ways – for audit case selection and secondly, in real-time mode for supporting business decisions. Audit case selection uses the risk profile to determine the recommended type of audit to be performed (ranging from inspection audits where no revised assessment is issued, to audits that lead to a change in assessed liability covering: document audit, desk / office audit, refund audit to field audit). The specific rules that trigger the selection of the audit case also provide an indication of where the audit should initially focus – we refer to these as 'areas of suspicion' and they should be provided to the audit team to provide points of focus at the outset of the audit.

The real-time use of the risk profile permits system-based decision-making within specific business processes. For example – enforcement actions should not all commence with the same action. Higher risk taxpayers warrant an immediate escalation of the enforcement steps to adequately mitigate the risk of loss of revenue. Our risk profiles permit automated decision making within the enforcement, refunds management, de-registration, audit case selection and objection / appeals guarantee lodgment business areas.

Rules design workbench

Web based: Accessed via controlled intranet within the RA

Flexible: Rules may be added, adjusted and tuned to accommodate change

Collaborative: Maintenance and research by authorized audit team

Intuitive: Design workbench supports rule management without coding knowledge

Confidential: Rule criteria are maintained in strictest confidence

Access Controlled: Access only by authorized audit team – usually head office based

e-ris Risk Engine rule characteristics

Tax specific: Designed specifically for tax and customs risk analysis

Weighted: Priority may be assigned to rules to reflect importance of event on risk

Probability sensitive: Rules specifically evaluate probability of risk materialising

Liability exposure: Risk profile is adjusted based on the liability or tax exposure

Trend capable: Historical trends support current and future predictive forecasting

Powerful comparative analysis: Permits data comparison between returns submitted

Matching to external data: Comparative analysis between tax and 3rd party data

Risk profiles

Debt and liquidity risk: Risk of wilful non payment and of inability to pay

Evasion risk: Risk and likelihood of evasion activities

Fraud risk: Likelihood of fraudulent practice on mis-reporting

Real-time updating: Risk scores and profiles updated in real-time

Risk categorisation: Risk colour codes may be displayed to non-audit system users

Auditable: Source data comprising risk available for transparency and litigation purposes

Selective: Different profile structures may be used for different industries and taxpayer types

Evasion and fraud identification

Data consolidation and matching is the key to identifying fraud patterns and trends, especially when confronting different sources of such data:

▶ Comparing taxpayer economic activities declared in tax systems with regional trade registries can point to companies who stand out from the crowd in terms of tax type registration

▶ Comparing economic data from statistics agencies, demographical data from census bureaus, or accounting data from banking systems against taxpayer data from tax systems in order to identify out-of-trend events.

To efficiently support anti-evasion activities and actively reduce risks related to tax evasion, Atos have developed an innovative risk assessment engine specifically for use within tax administrations that takes the mathematical models, business trends and taxpayer profiles identified by analysts, and converts them into rules that can provide a near-real-time perspective on all risks and potential evasion events inherent to taxpayer behavior and tax authority activities.

This fundamental change of risk and evasion assessment paradigm dramatically shrinks the time between the risk event and the compliance or enforcement action taken to mitigate the event. It can even be used to pre-empt potential fraud or evasion events.

e-ris risk and tax intelligence components

The solution offered is based on third party components, which may be defined by the revenue authority themselves – and proprietary e-ris components which run on the standard commercial applications. For data warehouse we are open to using any industry standard database application, and similarly for the business intelligence layer, Oracle BI, SAS, SPSS or other enterprise BI applications may be employed (a number of open-source BI applications exist as well, and these are considered as valid choices too). These applications provide the generic business intelligence layer that provides the data mining and query toolset.

The e-ris Tax Intelligence layer together with the e-ris data model is where Atos provides significant added value by providing a tax specific intelligence layer:

▶ The e-ris Analytics component provides pre-defined queries to answer a multitude of tax management questions based on common KPIs found throughout revenue authorities

▶ The Risk Assessment engine and associated rules provide 'out of the box' risk profile solutions as well as a range of tools to maintain, add and enhance risk rules for country and economy specific tuning

▶ The Evasion Engine crawls through data and provides indications of potential evasion and fraud – again based on pre-defined search algorithms which may be maintained and tuned using the rules workbench

▶ The e-ris Workbench allows maintenance and tuning of all risk and evasion rules and functions

▶ Reporting component allows graphic and other dissemination of analytical intelligence, risk data and evasion suspicions to permitted tax officers and management.

Atos Tax and Customs Business Unit

Our specialist Tax and Customs Business Unit has a wide range of experience within risk, evasion and analytics as well as implementation experience within a large number of tax and customs authorities throughout the world. This expertise, together with world-leading Big Data expertise within Atos and Bull, make us an ideal business partner for revenue authority risk and tax intelligence solutions.

Contact us to have one of our consultants or subject matter experts contacting you to discuss your unique risk, anti-evasion, fraud detection and tax intelligence requirements.

For more information please contact:

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About Atos

Atos SE (Societas Europaea) is a leader in digital services with 2013 pro forma annual revenue of €10 billion and 86,000 employees in 66 countries. Serving a global client base, the Group provides Consulting & Systems Integration services, Managed Services & BPO, Cloud operations, Big Data & Security solutions, as well as transactional services through Worldline, the European leader in the payments and transactional services industry. With its deep technology expertise and industry knowledge, the Group works with clients across different business sectors: Defense, Financial Services, Health, Manufacturing, Media & Utilities, Public Sector, Retail, Telecommunications and Transportation.

Atos is focused on business technology that powers progress and helps organizations to create their firm of the future. The Group is the Worldwide Information Technology Partner for the Olympic & Paralympic Games and is listed on the Euronext Paris market. Atos operates under the brands Atos, Atos Consulting, Atos Worldgrid, Bull, Canopy, and Worldline.

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